[File 155] MEDLINE(R) 1950-2008/Jul 21
[File 73] EMBASE 1974-2008/Jul 22
[File 5] Biosis Previews(R) 1926-2008/Jul W3
[File 144] Pascal 1973-2008/Jul W2
[File 65] Inside Conferences 1993-2008/Jul 23
[File 35] Dissertation Abs Online 1861-2008/Nov
[File 23] CSA Technology Research Database 1963-2008/Jun
[File 45] EMCare 2008/Jul W1
[File 136] BioEngineering Abstracts 1966-2007/Jan
[File 6] NTIS 1964-2008/Jul W4
[File 8] Ei Compendex(R) 1884-2008/Jul W2
[File 95] TEME-Technology & Management 1989-2008/Jul W1
[File 98] General Sci Abs 1984-2008/Jul

```
? d s
Set     Items   Description
S1    1008362   S SPINE OR SPINAL OR VERTEBRA OR VERTEBRAE OR VERTEBRAL
OR FACET(2N)(POST OR POSTS OR JOINT? ?)
S2    4058334   S IMPLANT OR IMPLANTATION OR IMPLANTS OR ASSEMBLY OR
ASSEMBLIES OR DEVICE OR DEVICES
S3      42439   S S1 AND S2
limitall s3
S4       4405   S CONNECTOR? ? OR ROD OR RODS OR POST OR POSTS OR
CONNECTER? ? OR LATTICE? OR LADDER?
S5       1788   S SLIDING OR ADJUST? OR SLIDES OR SLIDEABL? OR SLIDABL?
OR MOVING OR MOVEABL? OR MOVABL?
S6       2633   S S5 OR ALIGN?
S7       9558   S FIXED OR STABLIS? OR STABLIZ? OR STATIONARY OR
STATIONERY OR SET OR RIGID OR NONMOVING OR UNMOVING OR LIMIT OR
LIMITING OR LOCK OR LOCKING OR FIXATION
S8      11899   S S1(5N)S2
S9        129   S S8 AND S4 AND S6 AND S7
S10        97   RD S9  (unique items)
S11       709   S S4(5N)(S6 OR S7)
S12       297   S S8 AND S11
S13       174   S S8(S)S11
S14       121   S S4(5N)S6
S15        49   S S14(S)S8
S16       468   S S4(3N)S7
S17        96   S S16(S)S8
S18       135   S S15 OR S17
S19        95   S S18 NOT S9
S20        58   RD S19  (unique items)
```

10/5/12 (Item 12 from file: 155)
Fulltext available through: STIC Full Text Retrieval Options

12302661 PMID: 9312702

[New developments in surgery of the injured spine]
Neue Entwicklungen in der Chirurgie der verletzten Wirbelsaule.
Blauth M; Knop C; Bastian L; Lobenhoffer P
Unfallchirurgische Klinik, Medizinische Hochschule Hannover.
Der Orthopade (GERMANY) May 1997 , 26 (5) p437-49 , ISSN: 0085-4530--Print
Journal Code: 0331266
Publishing Model Print
Document type: English Abstract; Journal Article; Review
Languages: GERMAN
Main Citation Owner: NLM
Record type: MEDLINE; Completed
Subfile: INDEX MEDICUS
There are many new options, and those procedures that are interesting from the aspect of traumatology have been selected: (1) A special positioning aid for the treatment of injuries to the cervical spine. The appliance has proved extremely useful for reduction and immobilization of fractures and dislocations and also allows reliable positioning of the head in all desired surgical positions when ventral and/or dorsal approaches are used. (2) A new titanium H-plate, which can be fixed either with the usual 3.5-mm-thick screws or with unconventional 4.5-mm-thick screws in the case of lesions to the lower cervical spine. (3) A new technique for less invasive atlanto-axial screw fixation, with a cannula system extending to the axis from small incisions at the level of the upper thoracic spine, by way of which the C-1 joint block can be drilled, milled and screwed. (4) Jeanneret's CerviFix rod system. This system has progressed beyond the drawbacks of plating as performed so far for internal fixation of the dorsal cervical spine, in which screws could be inserted only at predetermined intervals and angles. Movable grips, lateral stabilizers and extension pieces mean that the system is very well able to fulfil the demands of a variable and stable implant. (5) Transthoracic endoscopic spinal surgery, which is excellently suited to fusion of a traumatized segment to supplement reduction and instrumentation from a dorsal approach. (6) A reduced-invasion method at the thoracolumbar transition, with no insertion of implants from a ventral approach and blocking through a small left lateral thoracotomy with autogeneic shavings from the iliac crest. (49 Refs.)

10/5/16 (Item 16 from file: 155)
Fulltext available through: STIC Full Text Retrieval Options
MEDLINE(R)

09823894 PMID: 1862424
Triangulation of pedicular instrumentation. A biomechanical analysis.
Ruland C M; McAfee P C; Warden K E; Cunningham B W
Department of Orthopaedic Surgery, Johns Hopkins University, School of Medicine, Baltimore, Maryland.
Spine (UNITED STATES) Jun 1991 , 16 (6 Suppl) pS270-6 , ISSN: 0362-2436--Print Journal Code: 7610646
Contract/Grant No.: AR 38489; AR; United States NIAMS

Publishing Model Print
Document type: Journal Article; Research Support, Non-U.S. Gov't; Research Support, U.S. Gov't, P.H.S.
Languages: ENGLISH
Main Citation Owner: NLM
Record type: MEDLINE; Completed
Subfile: INDEX MEDICUS
Tensile load-to-failure pullout tests were performed on 54 cadaveric spinal segments. The vertebrae were grouped by adjacent levels and matched for bone mineral density (g/cm2), which was measured by dual-photon absorptiometry. Triangulation of Steffee screws and CD pedicle screws was accomplished by transverse plates specifically designed to increase fixation within the same vertebra before the longitudinal Steffee plate or CD rod was applied. A transverse plate with adjustable length was also tested to accommodate variable interpedicular distances. Comparative pullout load-to-failures were as follows: laminar hook, 809 SE 99.4 N; single CD pedicular screws, 863 SE 108 N; single Steffee pedicular screw, 1245 SE 75.3 N; adjustable transverse plate, 1341 SE 114; triangulated Steffee pedicle screws with a transverse plate, 1701 SE 151 N; and triangulated CD pedicle screws with a transverse plate, 2096 SE 115 N. Three triangulated constructs with pedicle screws and a transverse plate (CD, Steffee, and Kirschner) provided significantly greater fixation than conventional pedicular or laminar hook based instrumentation systems (P less than 0.05). Improved treatment of spinal deformities in the elderly and osteoporotic population is dependent on improving the fixation at the metal-bone interface of spinal implants Particularly in osteoporotic vertebrae, the strength of fixation of two triangulated pedicle screws is better than either laminar hooks or single pedicle screws. The strength of fixation of triangulated pedicle screws connected by a transverse plate is superior to a single pedicle screw because it is dependent on the mass of bone between the screws rather than simply the amount of bone within the screw thread.(ABSTRACT TRUNCATED AT 250 WORDS)

10/5/17 (Item 17 from file: 155)
Fulltext available through: STIC Full Text Retrieval Options
MEDLINE(R)

09653553 PMID: 2098222
The study and development of a connection device (D.R. IOR) in halo-plaster and halo-jacket immobilization and traction systems.
Parisini P; Savini R; Salfi C; Palmisani M; Ballarini P L
Centro Chirurgia del Rachide IOR, Bologna.
La Chirurgia degli organi di movimento (ITALY) Oct-Dec 1990 , 75 (4) p347-51 , ISSN: 0009-4749--Print Journal Code: 0372573
Publishing Model Print
Document type: Journal Article
Languages: ENGLISH, ITALIAN
Main Citation Owner: NLM
Record type: MEDLINE; Completed
Subfile: INDEX MEDICUS

Most of the halo connection devices currently used with both the halo-plaster and halo-vest cannot be adjusted on the different displacement planes during reduction treatment. This makes it difficult to obtain good radiograms for the interposition of connection bars. The connection device designed by the Rizzoli Orthopaedic Institute (D.R. IOR) allows for movements in rotation and translation, preventing loosening of the system. Moreover, radiographic monitoring may be obtained in the best conditions possible, by moving the connection rods backwards or forwards without changing the spinal axis.

10/5/19 (Item 19 from file: 155)
Fulltext available through: STIC Full Text Retrieval Options
MEDLINE(R)

08540939 PMID: 3338219
The internal skeletal fixation system. A new treatment of thoracolumbar fractures and other spinal disorders.
Aebi M; Etter C; Kehl T; Thalgott J
Department of Orthopaedic Surgery, University of Berne, Inselspital, Switzerland.
Clinical orthopaedics and related research (UNITED STATES) Feb 1988 , 227 p30-43 , ISSN: 0009-921X--Print Journal Code: 0075674
Publishing Model Print
Document type: Case Reports; Journal Article
Languages: ENGLISH
Main Citation Owner: NLM
Record type: MEDLINE; Completed
Subfile: AIM; INDEX MEDICUS
A new internal skeletal fixation system (ISFS) for stabilizing thoracolumbar fractures and other spinal disorders was developed by Dick in Switzerland. The ISFS is a modification of the Magerl external skeletal fixation system of the spine. The Dick modification consists of a threaded rod connected by clamps to Schanz screws and is located in the vertebral pedicles on both sides of the spine. Due to a stable angle between the rod and Schanz screw, a one-point fixation above and below the diseased vertebra is sufficient. The ISFS provides a short fixation and promotes fusion. Control of lordosis, kyphosis, and rotation of the spine is possible with threaded rod distraction and compression and through manipulation of the Schanz screws held by movable clamps. The advantage of the ISFS is the ability to achieve reduction and fixation with the same instrumentation. ISFS has been used in more than 90 patients and proven most adequate for thoracolumbar fractures and other localized spinal disorders. The Harrington system and its modifications are no longer in use for these problems.

10/5/20 (Item 20 from file: 155)
Fulltext available through: STIC Full Text Retrieval Options
MEDLINE(R)

07895470 PMID: 3956000

An internal fixator for posterior application to short segments of the thoracic, lumbar, or lumbosacral spine. Design and testing.
Krag M H; Beynnon B D; Pope M H; Frymoyer J W; Haugh L D; Weaver D L
Clinical orthopaedics and related research (UNITED STATES) Feb 1986 , (203) p75-98 , ISSN: 0009-921X--Print Journal Code: 0075674
Publishing Model Print
Document type: Journal Article; Research Support, U.S. Gov't, Non-P.H.S.
Languages: ENGLISH
Main Citation Owner: NLM
Record type: MEDLINE; Completed
Subfile: AIM; INDEX MEDICUS
A new spinal implant has been designed and biomechanical testing completed, intended for application to "short-segment" spinal defects such as disc degeneration, fracture, spondylolisthesis, or tumor. Major improvements over currently available devices include: only 2-3 vertebrae are spanned, not 5-7 as with Harrington rods; true three-dimensional fixation is achieved, preventing such problems as hook or rod dislocation; three-dimensional adjustment is easily accomplished, allowing fracture or spondylolisthesis reduction to be readily performed; attachment to vertebrae is by means of transpedicular screws eliminating deliberate encroachment into the spinal canal, such as Luque wires or Harrington hooks; no special alignment between screws is needed (such as with holes or slots in a plate), allowing screw placement to fully conform to anatomic structures; and laminectomy sites and lumbosacral junction are readily instrumented. Background investigations presented here for design of this device include: CT-defined pedicle morphometry showing that screws may be larger than those currently used; effect of pitch, minor diameter, and tooth profile on screw pull-out strength; mechanical testing of a compact, three-dimensionally adjustable, strong, nonloosening articulating clamp; and establishing of the relationship between depth of penetration and strength of fixation of transpeduncular screws.

10/5/22 (Item 22 from file: 155)
Fulltext available through: STIC Full Text Retrieval Options
MEDLINE(R)

07872358 PMID: 3945475
Early rod-sleeve stabilization of the injured thoracic and lumbar spine.
Edwards C C; Levine A M
Orthopedic clinics of North America (UNITED STATES) Jan 1986 , 17 (1) p121-45 , ISSN: 0030-5898--Print Journal Code: 0254463
Publishing Model Print
Document type: Journal Article
Languages: ENGLISH
Main Citation Owner: NLM
Record type: MEDLINE; Completed
Subfile: AIM; INDEX MEDICUS
The rod-sleeve method provides adjustable corrective forces in all directions so as to accomplish anatomic alignment and three-dimensional rigid fixation for acute spinal

injuries. The authors studied a prospective series of 135 consecutive cases treated with this new technique. Results showed improved indirect canal decompression and neurologic recovery, few complications, and greater maintenance of correction than previously reported.

0082417021 EMBASE No: 2008253578

Design and biomechanical test of sliding instrumentation of a pedicle screw system

Chen Q.-H.; Zhou Y.; Lu M.; Gao J.-C.; Wang L.; Zhang W.-J.
Department of Orthopedics, Xinqiao Hospital, Third Military Medical University of Chinese PLA, Chongqing 400037, China; Department of Orthopedics, The 211 Hospital of Chinese PLA, Harbin 150080 Heilongjiang Province, China
Author email: Cqh211@126.com; happyzhou@vip.163.com
Corresp. Author/Affil: Zhou Y.: Department of Orthopedics, Xinqiao Hospital, Third Military Medical University of Chinese PLA, Chongqing 400037, China
Corresp. Author Email: happyzhou@vip.163.com

Journal of Clinical Rehabilitative Tissue Engineering Research (J. Clin. Rehab. Tissue Eng. Res.) (China) March 25, 2008 , 12/13 (2569-2572)
ISSN: 1673-8225
Document Type: Journal ; Article Record Type: Abstract
Language: English Summary language: English; Chinese
Number of References: 16

Background: Locking pedicle screw system is commonly used in clinic, but it often suppresses spinal longitudinal growth of adolescent at growth phase. Thus, a pedicle screw system that can reduce even avoid the inhibition to spinal growth is needed. Objective: To compare the biomechanical performance of sliding instrumentation of pedicle screw system and traditional locking pedicle screw system. Design: Comparative observation. Setting: Department of Orthopedics, Xinqiao Hospital of Third Military Medical University of Chinese PLA, and Department of Orthopedics, the 211 Hospital of Chinese PLA. Materials: The experiment was performed at Department of Material Science, Harbin Institute of Technology on June 29th, 2007. Self-designed sliding pedicle screw system was made of Ti alloy by Wujin No. 3 Medical Instrument Factory Co., Ltd., Jiangsu Province. It consisted of sliding pedicle screw, orthopaedic rod and transversal coupling device. Twelve samples of fresh porcine spine were selected, and muscles attached on vertebral bodies of T SUB 1-L SUB 5 were removed carefully but integrity of main ligament and precessus articularis posterior was retained. Methods: The samples were randomly divided into sliding system group and locking system group with 6 samples in each group. Partial vertebral plate and surrounding ligaments of T SUB 12 as well as bilateral facet joints between T SUB 11-12 and T SUB 12-L SUB 1 were removed to induce spinal destabilization, then sliding pedicle screw system and locking pedicle screw system were respectively fixed onto T SUB 10, T SUB 12, and L SUB 2

vertebral bodies of two groups. The samples then were fixed into fixture, and put onto INSTAON-4505 axial compressor. The strain gauge was connected with YJ-31 static electricity resistance strain gauge instrument human to simulate human spinal load, and the center of gravity was loaded to induce forward flexion, backward extension, lateral flexion and axial construction. Load of 100, 200, 300, 400 and 500 N was given gradually, and displacement of T SUB 12 was measured under different loads. Main outcome measures: 1 Changes in principal stress and displacement under forward flexion, backward extension, lateral flexion and axial construction; 2 Spinal fixation intensity and rigidity. Results: No statistical difference was detected in main straining, displacement of apical vertebrae and intensity of fixation between sliding system group and locking system group under forward flexion, backward extension, lateral flexion and axial construction ($P > 0.05$). Conclusion: Sliding pedicle screw system has identical biomechanical stability as locking system. Furthermore, in sliding pedicle screw system, the screw and rod are coupled by sliding pattern, which extend along with spinal growth. It can be used to treat scoliosis at growth phase.

10/5/30 (Item 3 from file: 73)
Fulltext available through: STIC Full Text Retrieval Options
EMBASE

0080616713 EMBASE No: 2005260983
Standard and minimally invasive approaches to the spine
Lehman Jr. R.A.; Vaccaro A.R.; Bertagnoli R.; Kuklo T.R.
Department of Orthopaedic Surgery, Walter Reed Army Medical Center, Washington, DC 20307, United States
Author email: alexvaccaro3@aol.com
Corresp. Author/Affil: Vaccaro A.R.: Department of Orthopedic Surgery, Thomas Jefferson University, Rothman Institute, Philadelphia, PA 19107, United States
Corresp. Author Email: alexvaccaro3@aol.com
Orthopedic Clinics of North America (Orthop. Clin. North Am.) (United States) July 1, 2005 , 36/3 SPEC. ISS. (281-292)
CODEN: OCLNA ISSN: 0030-5898
Publisher Item Identifier: S0030589805000209
Item Identifier (DOI): 10.1016/j.ocl.2005.02.012
Document Type: Journal ; Review Record Type: Abstract
Language: English Summary language: English
Number of References: 25
Over the last several years, minimal-access exposure of the posterior spine has become more popular as newer access tools have been developed and refined, minimizing the morbidity and shortening the learning curve of previous endoscopic techniques. It has also become a popular choice for patients educated in the morbidities related to extensive soft tissue dissection and retraction commonly associated with open spinal procedures. The minimization of soft tissue dissection, the reduction of local paraspinal muscle tension and ischemia, and the reduction of intraoperative blood loss associated with minimal-access surgery have led to shorter hospital stays and a more accelerated recovery

time. The early experience with expandable-blade retractor systems for minimal-access decompression has been extremely encouraging. These systems are easily adjustable for customized exposure and provide superior illumination and visibility, affording the ability to perform multisegmental pedicle screw fixation through an open, direct surgical exposure, similar to open conventional procedures. The improved longitudinal and medial-lateral visibility offered by an independent blade retractor system appears to have significantly alleviated the access-related limitations experienced with static tubular systems or fluoroscopy-dependent implant-guided systems. The percutaneous spinal systems have demonstrated great success as a minimally invasive procedure for pedicle screw/rod placement; however, if the length of the three parallel incisions required for the placement of two ipsilateral screws and the introduction of the longitudinal connector (rod) percutaneously is measured, it is often comparable to or even greater than the single 2-in incision needed for successful use of an expandable-blade access system and paramedian fixation construct placement. In addition to the need for healing of three separate ipsilateral incisions, greater muscular disruption is required for rod placement with these systems due to the long-swing arm of the rod compared with the single, smaller muscle-splitting, direct Wiltse-type approach provided by expandable tube systems. A minimally invasive one- or two-level posterior exposure of the spine is now safely attainable with the latest minimal-access systems that exploit the biomechanics of an adjustable blade retractor. This technique is proving to be a valuable alternative operative approach to traditional open procedures. As the clinical use of these developing systems escalates, more outcomes data will become available to determine the value of these minimally invasive procedures. Acceptance of minimal-access approaches will be slower in spinal surgery than other surgical specialties due to the risks of neural injury in cases of misadventure. A slow conversion to minimal-access approaches will generally mimic modifications of traditional open approaches until safety records can be established and reproduced.

10/5/40 (Item 6 from file: 5)
Biosis Previews(R)

19358955 Biosis No.: 200700018696
Vertebral column support device which is assembled by means of clamping
Author: Anonymous; Gradel Thomas; Cottin Philippe; Jaby Yves; Lemaire Jean-Philippe
Author Address: Ayze, France**France
Journal: Official Gazette of the United States Patent and Trademark Office Patents AUG 22 2006 2006
Patent Number: US 07094237 Patent Date Granted: August 22, 2006 20060822
Patent Classification: 606-61 Patent Assignee: Vitatech Patent Country: USA
ISSN: 0098-1133
Document Type: Patent
Record Type: Abstract
Language: English
Abstract: A vertebral column support device is assembled by means of clamping. The

device includes bone screw- or hook-type vertebrae anchoring elements, the elements consisting of a threaded cylindrical part (5) and a stop collar (7). A fixing nut (8) can be screwed on the threaded cylindrical part (5) in order to fix a connecting sliding piece (4) which is mounted on a securing rod (3) having a circular section. In order to insure that the rod (3) and the connecting sliding piece (4) are secure, the securing rod (3) is clamped in a transverse groove (17) in the connecting sliding piece (4) using a clamp screw (21) and a little clamp (22) which is mounted in the corner of the groove. In this way, the inventive device is more rigid and can better support the vertebrae and, moreover, the device can be positioned and adjusted much more easily.

10/5/49 (Item 15 from file: 5)
Biosis Previews(R)

18649272 Biosis No.: 200510343772
Spinal vertebral fusion implant and method

Author: Lieberman Daniel M
Author Address: Phoenix, AZ 85020 USA**USA
Journal: Official Gazette of the United States Patent and Trademark Office Patents JAN 4 2005 2005
Patent Number: US 06837905 Patent Date Granted: January 04, 2005 20050104
Patent Classification: 623-1716 Patent Country: USA
ISSN: 0098-1133
Document Type: Patent
Record Type: Abstract
Language: English
Abstract: An implant and method for fusion of adjacent vertebra. The implant has a curved plate having bores for reception of bone screws. In one embodiment, aligned medial sots extend longitudinally in the plate. An interbody graft is attached to or is integrally formed with the plate. In use, retraction post are temporarily secured to adjacent vertebrae and the slots aligned with posts. The graft is inserted and adjacent vertebrae are compressed and held until permanent screw fixation is completed. The compression tool and the posts are removed leaving the vertebrae compressed against the graft to promote healing. In an alternate embodiment, the plate carries multiple grafts which are slidably relative to the plate.

10/5/51 (Item 17 from file: 5)
Biosis Previews(R)

17960144 Biosis No.: 200400330930
Transverse connector
Author: Burgess Ian C (Reprint); Serhan Hassan A; Varieur Michael S; Quevedo Felix G
Journal: Official Gazette of the United States Patent and Trademark Office Patents

1284 (2): July 13, 2004 2004
Medium: e-file
Patent Number: US 6761721 Patent Date Granted: July 13, 2004 20040713 Patent Classification: 606-61 Patent Assignee: DePuy AcroMed, Inc. Patent Country: USA
ISSN: 0098-1133 _(ISSN print)
Document Type: Patent
Record Type: Abstract
Language: English
Abstract: A transverse connector for a spinal column corrective device for interconnecting two components connectable with vertebrae of a spinal column includes a first member having a body portion and a connector portion extending from the body portion, the connector portion including an opening for receiving the first component, a second member having a body portion and a connector portion extending from the body portion, the connector portion including an opening for receiving the second component, and a clamp extending between the first and second member body portions, the clamp being movable into a tightened position to lock the first and second members into position relative to one another, and a loosened position to permit adjustment of the position of the first and second members relative to one another. The first and second member body portions having mating retaining surfaces to prevent relative movement between the first and second members when the clamp is in the tightened position.

10/5/52 (Item 18 from file: 5)
Biosis Previews(R)

17500938 Biosis No.: 200300469657
Adjustable transverse connector for use with a spinal implant system

Author: Altarac Moti (Reprint); Meilinger Philip A
Author Address: Aliso Viejo, CA, USA**USA
Journal: Official Gazette of the United States Patent and Trademark Office Patents 1274 (2): Sep. 9, 2003 2003
Medium: e-file
Patent Number: US 6616668 Patent Date Granted: September 09, 2003 20030909 Patent Classification: 606-61 Patent Assignee: Cross Medical Products, Inc. Patent Country: USA
ISSN: 0098-1133 _(ISSN print)
Document Type: Patent
Record Type: Abstract
Language: English
Abstract: The present invention relates to a transverse connector having an assembly, which joins two spinal rods to form a spinal implant construct. The transverse connector has two members each having terminal clamping members such as opposing rod recesses each having a biasing setscrew, which locks the rod into position in the recess. The first of the two members has a bore, which receives the cylindrical extension of the other part so that it can move inward and outward and rotate in the bore. Further, the connector has a limiting mechanism, which comprises a vertical keyway which

receives and captures the flanged end of the extension in a slot having opposed undercut areas so that the flanged end can be inserted into the keyway and slid downward toward the bore. The extension further has a second flanged area in order to avoid over-insertion of the second member into the first member.

10/5/55 (Item 21 from file: 5)
Biosis Previews(R)

17192443 Biosis No.: 200300151162
Lateral fixation plates for a spinal system

Author: Ray R Charles (Reprint)
Author Address: Tacoma, WA, USA**USA
Journal: Official Gazette of the United States Patent and Trademark Office Patents 1267 (3): Feb. 18, 2003 2003
Medium: e-file
Patent Number: US 6520990 Patent Date Granted: February 18, 2003 20030218
Patent Classification: 623-1711 Patent Assignee: SDGI Holdings, Inc. Patent Country: USA
ISSN: 0098-1133 _(ISSN print)
Document Type: Patent
Record Type: Abstract
Language: English
Abstract: An implant system for spinal fixation includes a fastener having an upper portion, a lower portion configured to engage a vertebra, and a shoulder between the upper and lower portions. A connector is provided for engaging the fastener to an elongated rod that is positionable along the spinal column laterally from a line containing the axis of the fastener. The connector includes a first portion for engaging the upper portion of the fastener adjacent the shoulder, and an integral second portion having a surface for engaging the elongated spinal rod. The connector further includes an elongated slot between the first portion and the second portion to permit relative lateral adjustment between the rod and the upper portion of the fastener. A threaded fastener is provided for clamping the rod against the surface of the connector. In one embodiment, the fastener includes an eyebolt defining an aperture for receiving the spinal rod. In another embodiment of the invention, the connector includes an elongated plate that defines a slot through which the second portion of the fastener is received. This slot includes a plurality of grooves on a surface of the plate facing the rod, each of the grooves configured to receive a portion of the rod therein.

10/5/56 (Item 22 from file: 5)
Biosis Previews(R)

17055874 Biosis No.: 200300014593
Spinal rod transverse connectors

Author: Gertzbein Stanley (Reprint); Sherman Michael C
Journal: Official Gazette of the United States Patent and Trademark Office Patents 1263 (5): Oct. 29, 2002 2002
Medium: e-file
Patent Number: US 6471704 Patent Date Granted: October 29, 2002 20021029 Patent Classification: 606-61 Patent Assignee: SDGI Holdings, Inc. Patent Country: USA
ISSN: 0098-1133 _(ISSN print)
Document Type: Patent
Record Type: Abstract
Language: English
Abstract: A transverse fixator assembly for spanning between a number of longitudinal members situated adjacent a patient's vertebrae and methods for fixation of the spine which allow variation of the distance between two or more vertebrae. The assembly includes a number of connectors configured to span the distance between and engage the longitudinal members. The connectors define a thru-hole for engaging a bone bolt which is engaged to a vertebra plus a number of spikes projecting from the connector. A locking mechanism is configured to prevent the bolt from rotating relative to the connector when the nut is being tightened. One or more of the connectors may be a dynamic connector which is slidably engaged to the longitudinal members to vary the distance between the vertebrae for compression or distraction.

10/5/63 (Item 29 from file: 5)
Biosis Previews(R)

16347134 Biosis No.: 200100518973
Surgical guide rod

Author: Brumfield David L; Myrick Paige A (Reprint); Barker B Thomas; Drewry Troy D
Author Address: Memphis, TN, USA**USA
Journal: Official Gazette of the United States Patent and Trademark Office Patents 1246 (4): May 22, 2001 2001
Medium: e-file
Patent Number: US 6235028 Patent Date Granted: May 22, 2001 20010522 Patent Classification: 606-53 Patent Assignee: SDGI Holdings, Inc. Patent Country: USA
ISSN: 0098-1133
Document Type: Patent
Record Type: Abstract
Language: English
Abstract: An instrument and method for guiding a spinal implant from a location outside of a patient's body to a location adjacent an exposed portion of a bone anchor engaged to the patient's spine. The instrument is a guide rod having a connecting portion and a guiding portion disposed along a longitudinal axis, with the connecting portion having a shaped end portion adapted to releasably engage a corresponding shaped end portion of the bone anchor. The guiding portion slideably engages a spinal implant and guides the implant along the

longitudinal axis until the implant is positioned adjacent the exposed portion of the bone anchor for fixation thereto. The guide rod is then selectively separated or detached from the bone anchor and removed from the patient's body. In one aspect of the invention, the guiding portion is at least partially formed of a malleable material, such as aluminum or a shape-memory material, to allow the guiding portion to be bent or reshaped.

10/5/73 (Item 3 from file: 23)
CSA Technology Research Database

0009587491 IP Accession No: 200807-71-0898299; 200807-61-0998809; 20080864375; A08-99-0968423
Anterior screw-rod connector
Gertzbein, Stanley; Sherman, Michael C
, USA
Publisher Url: http://patft.uspto.gov/netacgi/nph-Parser?Sect1=PTO2&Sect2=HITOFF&u=/netaht ml/PTO/search-adv.htm&r=1&p=1&f=G&l=50&d=PTXT&S1=5620443.PN.&OS=pn/5620443& RS=PN/5620443
Document Type: Patent
Record Type: Abstract
Language: English
File Segment: Metadex; Mechanical & Transportation Engineering Abstracts; ANTE: Abstracts in New Technologies and Engineering; Aerospace & High Technology
Abstract:
A transverse fixator assembly for spanning between a number of longitudinal members situated adjacent a patient's vertebrae and methods for fixation of the spine which allow variation of the distance between two or more vertebrae. The assembly includes a number of connectors configured to span the distance between and engage the longitudinal members. The connectors define a thru-hole for engaging a bone bolt which is engaged to a vertebra plus a number of spikes projecting from the connector. A locking mechanism is configured to prevent the bolt from rotating relative to the connector when the nut is being tightened. One or more of the connectors may be a dynamic connector which is slidably engaged to the longitudinal members to vary the distance between the vertebrae for compression or distraction.

10/5/79 (Item 9 from file: 23)
CSA Technology Research Database

0008974897 IP Accession No: 200804-71-397322; 200804-61-421202; 2008383140; A08-99-409286
Spinal fixation device with laterally attachable connectors
Apfelbaum, Ronald I; Dinkler II, Charles E
, USA
Publisher Url: http://patft.uspto.gov/netacgi/nph-Parser?Sect1=PTO2&Sect2=HITOFF&u=/netaht ml/PTO/search-adv.htm&r=1&p=1&f=G&l=50&d=PTXT&S1=5928233.PN.&OS=pn/5928233& RS=PN/5928233

Document Type: Patent
Record Type: Abstract
Language: English
File Segment: Metadex; Mechanical & Transportation Engineering Abstracts; ANTE: Abstracts in New Technologies and Engineering; Aerospace & High Technology
Abstract:
A spinal fixation device includes a threaded stud having an open-ended axial slot to straddle a rod of a vertebral support, and a bracket which is rotatable on the stud. A vertebra bone screw passes through an opening in a distal end of the bracket. The stud and bracket are locked in position relative to the rod by a nut. An insert within the slot bears against the rod and prevents the stud from being deformed by the force of the nut on the stud segments. The bracket can be rotated around the stud; and the stud can be rotated around and slid along the rod, to afford great adjustability and ease of attachment.

10/5/86 (Item 16 from file: 23)
CSA Technology Research Database

0008677247 IP Accession No: 200803-71-204087; 200803-61-203686; 2008194614; A08-99-199096
Dynamic spinal screw-rod connectors
Gertzbein, Stanley; Sherman, Michael C
, USA
Publisher Url: http://patft.uspto.gov/netacgi/nph-Parser?Sect1=PTO2&Sect2=HITOFF&u=/netaht ml/PTO/search-adv.htm&r=1&p=1&f=G&l=50&d=PTXT&S1=6083224.PN.&OS=pn/6083224& RS=PN/6083224
Document Type: Patent
Record Type: Abstract
Language: English
File Segment: Metadex; Mechanical & Transportation Engineering Abstracts; ANTE: Abstracts in New Technologies and Engineering; Aerospace & High Technology
Abstract:
A transverse fixator assembly for spanning between a number of longitudinal members situated adjacent a patient's vertebrae and methods for fixation of the spine which allow variation of the distance between two or more vertebrae. The assembly includes a number of connectors configured to span the distance between and engage the longitudinal members. The connectors define a thru-hole for engaging a bone bolt which is engaged to a vertebra plus a number of spikes projecting from the connector. A locking mechanism is configured to prevent the bolt from rotating relative to the connector when the nut is being tightened. One or more of the connectors may be a dynamic connector which is slidably engaged to the longitudinal members to vary the distance between the vertebrae for compression or distraction.

20/5/25 (Item 2 from file: 5)
Biosis Previews(R)

19346314 Biosis No.: 200700006055
Artificial facet joint and method -- (this is the inventor but a different patent)
Author: Anonymous; Simonson Peter M
Author Address: Miami Beach, FL 39139 USA**USA
Journal: Official Gazette of the United States Patent and Trademark Office Patents AUG 1 2006 2006
Patent Number: US 07083622 Patent Date Granted: August 01, 2006 20060801 Patent Classification: 606-61 Patent Country: USA
ISSN: 0098-1133
Document Type: Patent
Record Type: Abstract
Language: English
Abstract: An artificial facet joint includes a spinal implant rod and a connector. The connector includes a screw and a rod connecting member having structure for engagement of the rod. The rod connecting member is pivotally engaged to the screw. The rod may also be held slideably within the connector enabling the rod to be moved relative to the connector.

[File 621] Gale Group New Prod.Annou.(R) 1985-2008/Jul 24
[File 441] ESPICOM Pharm&Med DEVICE NEWS 2008/Aug W4
[File 149] TGG Health&Wellness DB(SM) 1976-2008/Jun W4
[File 624] McGraw-Hill Publications 1985-2008/Jul 22
[File 636] Gale Group Newsletter DB(TM) 1987-2008/Jul 16
[File 135] NewsRx Weekly Reports 1995-2008/Jul W2.

? d s

```
Set     Items   Description
S1      69872   S SPINE OR SPINAL OR VERTEBRA OR VERTEBRAE OR VERTEBRAL
OR FACET(2N)(POST OR POSTS OR JOINT? ?)
S2    1179497   S IMPLANT OR IMPLANTATION OR IMPLANTS OR ASSEMBLY OR
ASSEMBLIES OR DEVICE OR DEVICES
S3      18334   S S1 AND S2
limitall s3
S4       2968   S CONNECTOR? ? OR ROD OR RODS OR POST OR POSTS OR
CONNECTER? ? OR LATTICE? OR LADDER?
S5       1288   S SLIDING OR SLIDES OR SLIDEABL? OR SLIDABL? OR MOVING
OR MOVEABL? OR MOVABL?
S6       5809   S FIXED OR STABLIS? OR STABLIZ? OR STATIONARY OR
STATIONERY OR SET OR RIGID OR NONMOVING OR UNMOVING OR LIMIT OR
LIMITING OR LOCK OR LOCKING OR FIXATION
S7       5357   S S1(5N)S2
S8        146   S S4(5N)(S5 OR S6)
S9         16   S S7(S)S8
S10         0   S S7(S)S4(S)S5(S)S6
S11       218   S S4(10N)(S5 OR S6)
S12        27   S S7(S)S11
S13        11   S S12 NOT S9
S14        11   RD S13  (unique items)
```

0000776192 (USE FORMAT 7 OR 9 FOR FULLTEXT)

University of Berlin details research in scoliosis

Biotech Business Week, March 24, 2008, p.1440
DOCUMENT TYPE: Expanded Reporting LANGUAGE: English
RECORD TYPE: FULLTEXT

Word Count:
629

...TEXT: from Berlin, Germany, "The orthobiom (TM) non-fusion scoliosis correction system consists of two longitudinal rods, polyaxial pedicle screws, mobile and fixed connectors and a cross-connector (see also). The mobile connectors can move along and around the rod, thus allowing length...

...For comparison, three connection variations of screws and rods were investigated: (1) an implant with rigid screws and mobile connectors (M4), (2) an implant with non-locking polyaxial screws and fixed connectors (M5) and (3) a completely rigid implant construct (M6). For flexion, extension and lateral bending, intervertebral rotation was reduced at all...

...levels due to the implants. A rigid implant construct (M6) and an implant with non-locking polyaxial screws and fixed connectors (M5) led to the strongest reduction of intervertebral rotation. The orthobiom (TM) non- fusion implant...

...rotation was strongly reduced by a rigid implant construct (M6) and by an implant with rigid screws and mobile connectors (M4). For rotation, an implant with non-locking polyaxial screws (M2, M3, M5) led to nearly the same intervertebral rotations as in an intact spine without an implant (M1). The predicted maximum translation of the mobile connectors along the rod was 4.2...

..The movement of the connectors was highest for those closest to the ends of the rods. With rigid screws, the maximum translation was significantly reduced. This study, conducted under a load-controlled loading...

...rotation was reduced much less by the non-fusion orthobiom (TM) system than by a rigid implant. The mobile connectors moved considerably along the rod when the spine was bent," wrote A. Rohlmann and colleagues...

[File 350] Derwent WPIX 1963-2008/UD=200846

[File 347] JAPIO Dec 1976-2007/Dec(Updated 080328)

```
Set     Items   Description
S1      38261   S SPINE OR SPINAL OR VERTEBRA OR VERTEBRAE OR VERTEBRAL
OR FACET(2N)(POST OR POSTS OR JOINT? ?)
S2    8002554   S IMPLANT OR IMPLANTATION OR IMPLANTS OR ASSEMBLY OR
ASSEMBLIES OR DEVICE OR DEVICES
S3      15434   S S1 AND S2
limitall s3
S4       3520   S CONNECTOR? ? OR ROD OR RODS OR POST OR POSTS OR
CONNECTER? ? OR LATTICE? OR LADDER?
S5       2958   S SLIDING OR SLIDES OR SLIDEABL? OR SLIDABL? OR MOVING
OR MOVEABL? OR MOVABL?
S6       6635   S FIXED OR STABLIS? OR STABLIZ? OR STATIONARY OR
STATIONERY OR SET OR RIGID OR NONMOVING OR UNMOVING OR LIMIT OR
LIMITING OR LOCK OR LOCKING OR FIXATION
S7       6545   S S1(5N)S2
S8        127   S S7(S)S4(S)S5(S)S6
S9        390   S S4(10N)S5
S10        65   S S7(S)S9(S)S6
S11       498   S S5(10N)S6
S12        47   S S7(S)S4(S)S11
S13        17   S S12 NOT S10
```

10/25/1 (Item 1 from file: 350)
Fulltext available through: Order File History

0017494358 & & *Drawing available*
WPI Acc no: 2008-D14799/200822
XRPX Acc No: N2008-246078
Vertebral member supporting device for e.g. spinal stabilization, has elastic members for limiting relative movement of vertebral members via sliding motion between rod and anchor, where anchors are attached to vertebral members
Patent Assignee: ANDERSON K M (ANDE-I); BONIN H K (BONI-I); BRUNEAU A (BRUN-I); CARLS T A (CARL-I); DEWEY J M (DEWE-I); LANGE E C (LANG-I); POND J D (POND-I)
Inventor: ANDERSON K M; BONIN H K; BRUNEAU A; CARLS T A; DEWEY J M; LANGE E C; POND J D

Patent Family (1 patents, 1 & countries)

Patent Number	Kind	Date	Update	Type
US 20080065079	A1	20080313	200822	B

US 20080065079
Local Applications (no., kind, date): US 2006530662 A 20060911

Priority Applications (no., kind, date): US 2006530662 A 20060911
Alerting Abstract US A1
NOVELTY - The device has anchors (90) attached to vertebral members (200). An elongated member has a section mated to one of the anchors, and another section mated to another anchor for sliding motion. Elastic members (20) are connected to a rod (100) on sides of the latter anchor. The elastic members limit relative movement of the vertebral members via a sliding motion between the rod and the latter anchor to an amount in a direction and another amount in another direction, where the amounts are uneven.
DESCRIPTION - An INDEPENDENT CLAIM is also included for a method for supporting vertebral members.
USE - Device for supporting a vertebral member and providing asymmetrical movement of the vertebral member in a spine of a patient, and for spinal stabilization during vertebral movement.
ADVANTAGE - The design of the device prevents damage of the vertebral members and intervertebral discs to prevent a specific event such as trauma, degenerative condition, tumor and infection, and avoids pain, neurological deficit, and loss of motion, thus redistributing stresses and/or restoring proper alignment of the vertebral members, and hence facilitating motion of the vertebral members.

10/25/2 (Item 2 from file: 350)
Fulltext available through: Order File History
Derwent WPIX

0017339855 & & *Drawing available*
WPI Acc no: 2008-B60294/200811
XRPX Acc No: N2008-126508
Cross connector for connecting spinal fixation rod to e.g. sacrum in spinopelvic region has a sliding connector head with a receiving portion for cross part and a second receiving portion for a spinal fixation rod
Patent Assignee: DEPUY SPINE INC (DEPU-N)
Inventor: CHAO N T; GUPTA M; SYLVIA R

Patent Family (2 patents, 120 & countries)

Patent Number	Kind	Date	Update	Type
US 20080021456	A1	20080124	200811	B
WO 2008013623	A2	20080131	200811	E

US 20080021456
Local Applications (no., kind, date): US 2006459176 A 20060721; WO 2007US14677 A 20070625
Priority Applications (no., kind, date): US 2006459176 A 20060721
Alerting Abstract US A1
NOVELTY - A sliding connector head (11,12) has a receiving portion (27) that is defined by an opening through the connector head for receiving a cross part and a second receiving portion (28) that is defined by a recess (29) between two opposed arms (30,31) for receiving a spinal fixation rod. A guide channel on the cross part guides the movement of the sliding

connector head. The spinal fixation rod is locked within the connector head and the connector head is secured on the cross part.

10/25/7 (Item 7 from file: 350)
Fulltext available through: Order File History
Derwent WPIX

0016007636 & & *Drawing available*
WPI Acc no: 2006-539266/200655
XRPX Acc No: N2006-432104
Self-contouring spinal rod assembly for spinal implant system, has rod elements that are fixed against movement relative to each other at distal end, and are movable relative to each other along length proximal distal end
Patent Assignee: AESCULAP AG & CO KG (AESC-N); RICHELSOPH M E (RICH-I)
Inventor: RICHELSOPH M E; RICHELSOPH M

Patent Family (3 patents, 112 & countries)

Patent Number	Kind	Date	Update	Type
WO 2006079531	A1	20060803	200655	B
EP 1841375	A1	20071010	200766	E
US 20080091214	A1	20080417	200829	E

WO 2006079531
Local Applications (no., kind, date): WO 2006EP673 A 20060126; EP 2006706422 A 20060126; WO 2006EP673 A 20060126; US 2005647151 P 20050126; WO 2006EP673 A 20060126; US 2007881293 A 20070726
Priority Applications (no., kind, date): US 2005647151 P 20050126; WO 2006EP673 A 20060126; US 2007881293 A 20070726

Alerting Abstract WO A1
NOVELTY - The assembly (100) has a proximal end (102), a distal end (104), and a length (106) extending between proximal and distal ends. Multiple rod elements (110) extend along the length, such that each rod element contacts with an adjacent rod element. The rod elements are fixed against movement relative to each other at the distal end, and are movable relative to each other along a length proximal the distal end.
USE - For spinal implant system.
ADVANTAGE - Reduces or eliminates rod contouring during insertion while providing sufficiently rigid support of spinal implant system. Allows alignment of spine to be adjusted and/or held in a specific manner to allow fusion to occur.

10/25/23 (Item 23 from file: 350)
Fulltext available through: Order File History
Derwent WPIX

0014283772 & & *Drawing available*
WPI Acc no: 2004-470343/200445
XRPX Acc No: N2004-371701
Spinal fixation device for correcting curvature of spine includes slidable connection for connecting an anchoring screw to a solidifying rod, with slidable connection including a point designed to penetrate a vertebral bone
Patent Assignee: GRADEL T (GRAD-I); LEMAIRE J (LEMA-I); VITATECH (VITA-N); VITATECH SA (VITA-N)
Inventor: GRADEL T; LEMAIRE J; LEMAIRE J P

Patent Family (6 patents, 30 & countries)

Patent Number	Kind	Date	Update	Type
FR 2848408	A1	20040618	200445	B
WO 2004064654	A1	20040805	200451	E
EP 1578289	A1	20050928	200563	E
JP 2006510462	W	20060330	200623	E
US 20060116676	A1	20060601	200637	E
KR 2005084351	A	20050826	200644	E

FR 2848408
Local Applications (no., kind, date): FR 200216235 A 20021217; WO 2003FR3735 A 20031216; EP 2003815409 A 20031216 ; WO 2003FR3735 A 20031216; WO 2003FR3735 A 20031216; JP 2004567007 A 20031216; WO 2003FR3735 A 20031216; US 2005539161 A 20050614; WO 2003FR3735 A 20031216; KR 2005711114 A 20050616
Priority Applications (no., kind, date): FR 200216235 A 20021217

Alerting Abstract FR A1
NOVELTY - The spinal fixation device includes a slidable connection (4) for interconnecting an anchoring screw (1) and a solidifying rod (3). The sliding connection includes a hole (16) for passage of the anchoring screw, and a reception device (18) for receiving a section of the rod, oriented along a transverse axis and for receiving a tightening device (21,22) for tightening the rod in the reception device. The sliding connection also includes a point (9) designed for penetrating a vertebral bone to retain the sliding connection on the bone.
USE - Spinal fixation device for treating degenerative arthrosis or traumatic vertebral fractures and for correcting curvature of the spinal column such as scoliosis, lordosis and kyphosis.
ADVANTAGE - Improves fixation of sliding connection on spinal vertebra.

10/25/35 (Item 35 from file: 350)
Fulltext available through: Order File History
Derwent WPIX

0010846989 & & *Drawing available*
WPI Acc no: 2001-465442/200150

XRPX Acc No: N2001-345247
Intervertebral connecting system has connecting bars between anchoring elements equipped with slidable fixings for lengthwise rods
Patent Assignee: BONE & JOINT RES SA (BONE-N); MUNTING E (MUNT-I); SCIENT'X (SCIE-N); SCIENT'X SA (SCIE-N); SCIENT'X SARL (SCIE-N)
Inventor: MUNTING E

Patent Family (9 patents, 93 & countries)

Patent Number	Kind	Date	Update	Type
WO 2001054597	A1	20010802	200150	B
FR 2804314	A1	20010803	200150	E
AU 200131921	A	20010807	200174	E
EP 1250101	A1	20021023	200277	E
JP 2003521302	W	20030715	200347	E
US 20030144665	A1	20030731	200354	E
US 6916319	B2	20050712	200546	E
EP 1250101	B1	20051221	200604	E
DE 60116050	E	20060126	200614	E

WO 2001054597
Local Applications (no., kind, date): WO 2001FR259 A 20010126; FR 20001071 A 20000127; AU 200131921 A 20010126; EP 2001903979 A 20010126; WO 2001FR259 A 20010126; JP 2001555577 A 20010126; WO 2001FR259 A 20010126; WO 2001FR259 A 20010126; US 2002182349 A 20021105; WO 2001FR259 A 20010126; US 2002182349 A 20021105; EP 2001903979 A 20010126; WO 2001FR259 A 20010126; DE 60116050 A 20010126; EP 2001903979 A 20010126; WO 2001FR259 A 20010126
Priority Applications (no., kind, date): FR 20001071 A 20000127

Alerting Abstract WO A1
NOVELTY - The connecting system consists of vertebral anchors (3) joined by curved connecting bars (6) with slidable fixings (14) for lengthwise rods (15). The connecting bars are joined to the anchors by fixings (7) which allow them to be rotated about their axes and locked in the required position. Both bars and rods are locked in place by clamping collars (8, 23) with threaded couplings and nuts (12, 17).
USE - Stabilising spine or correcting deformity such as scoliosis.
ADVANTAGE - The system provides for simpler connection between anchors, bars and rods, with limited mechanical stresses.

13/25/7 (Item 7 from file: 350)
Fulltext available through: Order File History
Derwent WPIX

0014585038 & & *Drawing available*
WPI Acc no: 2004-767001/200475

XRPX Acc No: N2004-605112

Bone fixation device for retaining vertebra of spinal column in desired spatial relationship, has first and second components movable relative to one another across range of motion based on transition state of adjustor components

Patent Assignee: ABDOU M S (ABDO-I); ABDOU S M (ABDO-I)
Inventor: ABDOU M S; ABDOU S M

Patent Family (3 patents, 106 & countries)

Patent Number	Kind	Date	Update	Type
WO 2004093702	A2	20041104	200475	B
US 20050004573	A1	20050106	200504	E
US 7291152	B2	20071106	200774	E

WO 2004093702

Local Applications (no., kind, date): WO 2004US12011 A 20040415; US 2003463805 P 20030418; US 2004825916 A 20040415; US 2003463805 P 20030418; US 2004825916 A 20040415

Priority Applications (no., kind, date): US 2003463805 P 20030418; US 2004825916 A 20040415

Alerting Abstract WO A2

NOVELTY - The device (5) has a first component (20) connectable to a first vertebra (V1), and a second component (30) connectable to a second vertebra (V2) and interconnected with the first component. The first and second components are movable relative to one another across a range of motion based on the transition state of several adjustor components (40).

DESCRIPTION - The range of motion between the first and second components spans a first distance when the adjustor component is in the first state. The range of motion between the first and second component spans a second distance when the adjustor components are in the second state.

USE - For retaining vertebra of spinal column in desired spatial relationship.

ADVANTAGE - Provides a variable length rod-based fixation device that is capable of accommodating bony subsidence at the level of the settling bone and not at the end of the device. Provides ease of use, reliable bone fixation, modular design that permits extension of fusion at a future date, accommodation of bone settling, and the ability to interact with an implantable distraction screw. Ensures proper device placement, and avoids maneuvers that weaken the vertebral bodies.